HAMAK® Solar

Solar Power Storage System

Supporting AC/DC output and auto utility transfer

HA-WCB1K24 / WCB2K48 / WCB3K48

USER's MANUAL

Before operating this unit, please read this manual thoroughly and retain it for future reference.

CAUTION

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER.
NO USER SERVICEABLE PARTS INSIDE.
PLEASE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING

TO PREVENT FIRE OR ELECTRIC SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
LIMITATIONS ON USE. THIS EQUIPMENT IS NOT INTENDED FOR USE WITH LIFE SUPPORT EQUIPMENT OR OTHER MEDICAL EQUIPMENT OR DEVICES.

For safe and optimum performance, the Solar Power Storage System must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the CAUTION and WARNING statements.

If you have technical problems, first contact your installer. For more about HAMAK products or any necessary assistance, please contact us:
Service Contact Information

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IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions for the following products:

- HA-WCB1K24
- HA-WCB2K48
- HA-WCB3K48

This manual must be followed during installation and maintenance. To reduce the risk of personal injury and to ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

Product Introduction

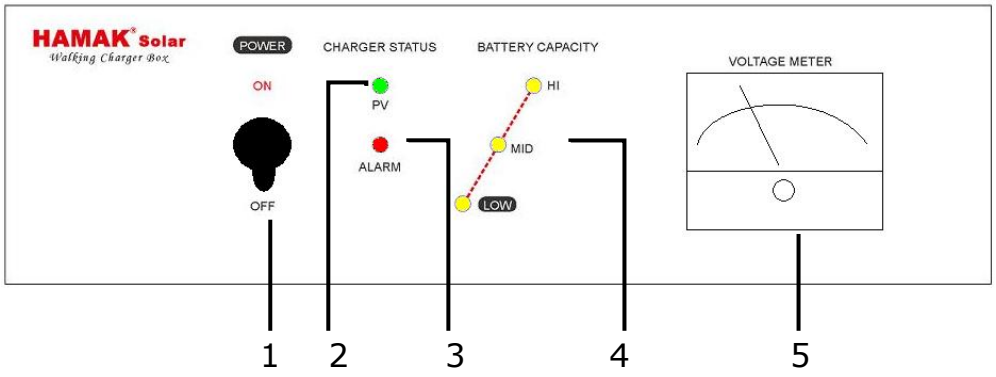
HA-WCB series of Solar Power Storage System is designed for the rated voltage 24Vdc(model HA-WCB1K24 only)/ 48Vdc system, built-in rechargeable and/or（VRLA）valve-regulated lead-acid batteries, connecting with solar panel which located in outdoor to generate the power. Just plug-in the connector from panels, then save the solar energy in storage system. To ensure there has continuously power supply to loads, it will automatically transfer to utility power when batteries in low condition.

Features

- DC output voltage 24V or 48V. AC output voltage 110V or 220V. Max.
- Built-in Used in high efficiency, deep cycle gel battery
- MPPT control system
- Battery reverses polarity/battery over discharge/overload protection.
- Built-in automatically transfer to utility power to loads when run out of battery.

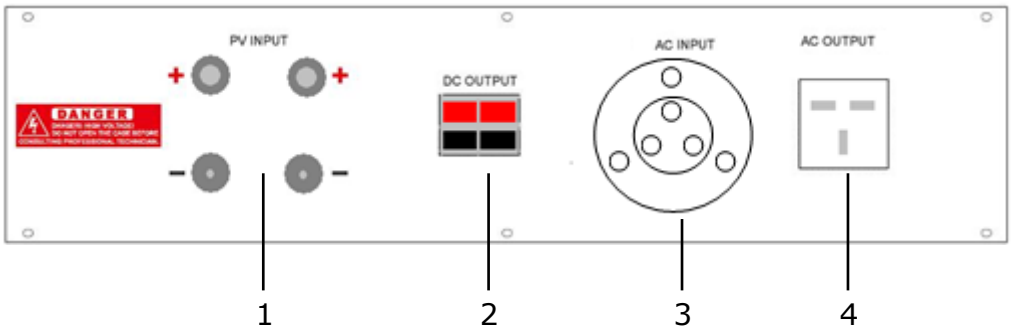
Product Description

Front Panel



1、POWER Switch：AC/DC power output ON/OFF
2、PV：Green LED lights when charger，please refer to P2
3、ALARM：Showing load condition, please refer to P2
4、BATTERY CAPACITY：Indicate battery capacity，please refer to P2
5、VOLTAGE METER：To measure AC output voltage

Back Panel



1、Solar power input
2、DC power output
3、AC power 220V or 110V input
4、AC power 220V or 110V output

Operation

Pre-startup Procedures

To avoid the occurrence of sparks and the risk of electric shock, please confirm the power is switch off before plug-in.
Double-check all wiring connections well.
Using a digital voltmeter (DVM) or standard voltmeter, verify battery voltage.
Confirm the voltage is correct, confirm the polarity.

	The components are close together and carry hazardous voltages. Use appropriate care to avoid the risk of electric shock or equipment damage.
	Incorrect battery polarity will damage the inverter. Excessive battery voltage also may damage the inverter. This damage is not covered by the warranty.

Operating

Locating the solar panels in outdoor without shadow, and connecting to "solar power input" in back panel. As long as the power switch on, AC 220V/AC 110V(optional) and 24Vdc(model HA-WCB1K24 only)/ 48Vdc power can be output.

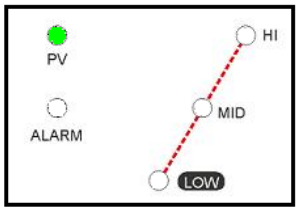
The battery power condition is monitored all the time after you connected the battery. The system only need 10mA power to maintain system's operation when switch off. The power will be transferred to utility power automatically to support the power to loads when run out of battery, and transferred back to battery's power when battery's available capacity over 20%.

Display function

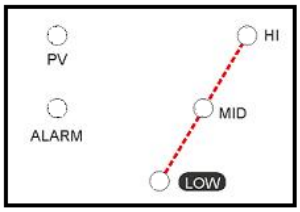
The controller has 5 LED indicators and one alarm to offer information. Under normal operation, the controller would display charging status, battery capacity state and error functions. When capacity getting change in battery, the light and buzzer will come out to display condition.

Charge status (PV indicator)

Display charge status from solar panel to battery, the indicator will showing below:



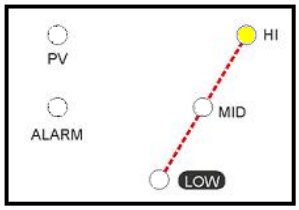
Charging,(PV light on)
PV power supply



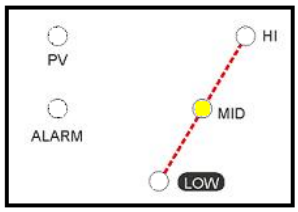
Un-charge(PV light off)
PV power does not supply

Battery capacity level (HI, MID, LOW indicator)

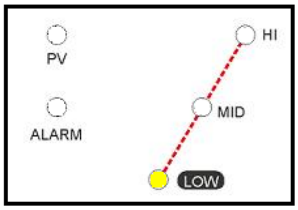
Display Battery capacity level, the indicator will showing below:



>75%



25-75%

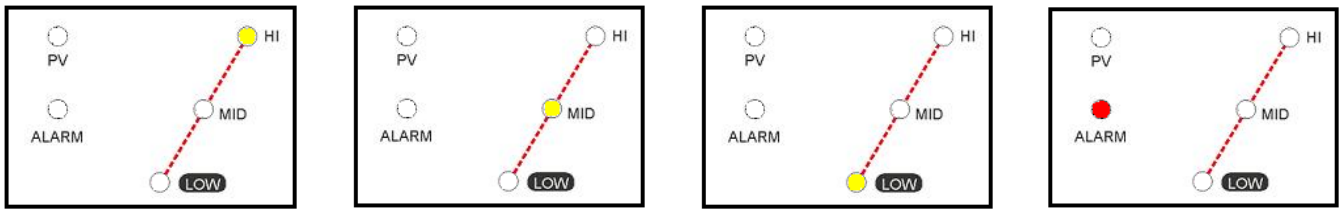


<25%

The various LED indicator meaning estimated value from battery's available capacity, such as 25-75%, meaning capacity of the battery's current situation.

Buzzer warning

The Sound signal from internal Buzzer for battery capacity warning, the indicator will showing below:



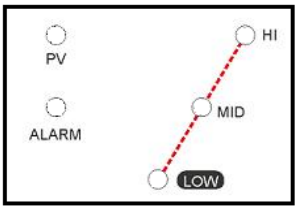
Buzzer once → Buzzer 3 times → Buzzer 25 times

High Capacity → Mid Capacity → Low Capacity → Discharge Protection

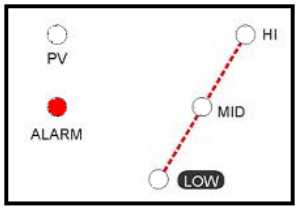
When the battery is discharged, the battery capacity changes from high to low by time, the system will make a prompt buzzer signal. When the battery capacity is less than 10%, discharge protection will be activated. 1 minute later after the buzzer 25 times in a row, DC load will be off directly. And the system will transfer AC power from battery supply to utility supply automatically.

Load status display (Alarm Indicator)

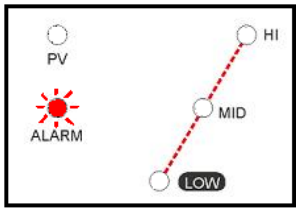
In the deeply discharge or load short circuit / overload condition, output load of the controller will turn off. The indicator will showing below:



Normal operation
（ALARM OFF）



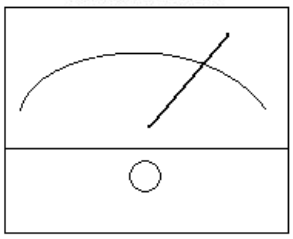
Discharge protection
（ALARM ON）



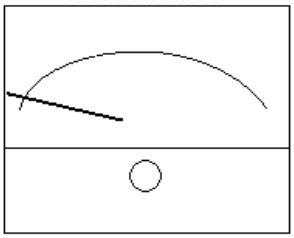
Overload or short circuit
（ALARM Flashing）

AC power status display (pointer voltmeter)

When the POWER switch ON, the voltage meter can immediately display the current value of the output AC voltage



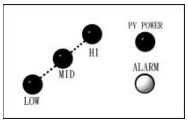
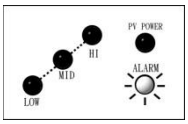
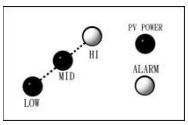
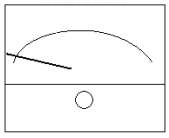
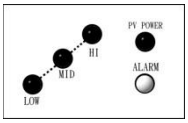
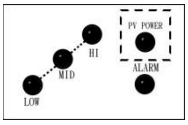
Normal operation
（POWER switch On）



Overload or battery no power
（POWER switch On）

Trouble Shooting

If you have trouble operating the camera, first refer to the following table. If the problem persists, contact the supplier for support for more information.

Symptom	Error Messages	Possible Cause	Possible Remedy
No Power supply to loads.	 ALARM indicator red light on	No power from battery.	1. Replace batteries. 2. Used in charging function to charge to the battery by itself, and load will re-open when power return to MID.
	 ALARM indicator Flashing	Load overflow or short circuit	Closes all loads and eliminates the breakdown, then load terminal open automatically in one minute later.
	 HI & ALARM indicator light on	Battery voltage too high or too low	To check if any voltage from battery, if not, means the controller damaged.
	 Voltmeter no reply	Battery no power or overload	1、 Replace the battery 2、 Used in charging function to charge to the battery by itself. 3、 Remove AC output load
Battery is empty after a short use	 ALARM indicator red light on	Battery has low capacity	1. Check whether the battery had been damaged. 2. Check whether the load short-circuit causing over discharge. 3. Using the charging function to charge again.
Battery is not being charged	 PV POWER indicator green light off	Solar module is error or polarity reversed.	Check Solar module and the wiring, and correct the fault connection.
Battery reverse	Buzzing continuously.	Battery polarity reversed.	Correct reversed.

Battery replacement

- To replace the batteries by professional person.
- Do not change battery size to the smaller or larger.
- Pay attention on battery polarity, the box were designed with protection on battery polarity, and buzzer reminding will come out when battery polarity.
- Used in re-chargeable and/or（VRLA）valve-regulated lead-acid battery.

Safety recommendations

- Batteries store a large amount of energy. Never short circuit a battery under all circumstances. We recommend connecting a fuse (slow acting type, according to the nominal controller current) directly to the battery terminal.
- Batteries can produce flammable gases. Avoid making sparks, using fire or any naked flame. Make sure that the battery room is ventilated.
- Avoid touching or short circuiting wires or terminals. Be aware that the voltages on specific terminals or wires can be up to double the battery voltage. Use isolated tools, stand on dry ground and keep your hands dry.
- Keep children away from batteries and the charge controller.
- Please observe the safety recommendations of the battery manufacturer. If in doubt, consult your dealer or installer.

HAMAK® Solar

Technical Data

Series	HA-WCB		
Model No.	HA-WCB1K24	HA-WCB2K48	HA-WCB3K48
voltage of solar panels	24V/100AH	48V/100AH	48V/200AH
Battery rated voltage /capacity	30~150Vdc	60~150Vdc	
MPPT	30~120Vdc	60~120Vdc	
Max. current of solar panels	60A		
Max. input power	1200W	2400W	3000W
AC max. output power	1000W	2000W	3000W
AC output operating time	1.5 hours	1.5 hours	2 hours
DC max. output power	240W	480W	
DC output operating time	6.5 hours	6.5 hours	13hours
AC output voltage(optional)	110Vac/220Vac		
AC output frequency(optional)	50HZ/60HZ		
DC output voltage	24Vdc	48Vdc	
Discharge voltage	22.5Vdc	45Vdc	
Floating voltage	28Vdc	56Vdc	
Start city power voltage	22.5Vdc	45Vdc	
City power off voltage	24Vdc	48Vdc	
Protection	Over load, Battery polarity, Battery over charge and over discharge, Over temperature		
Operating temperature	0~+40°C		
Storage temperature		-20~+50°C	
Length / Width / Height	690/520/500	500/520/950	620/520/950
IP Rating	IP44		

Technical date is subject to change without prior notice.